NASA Advanced Supercomputing Archive Environment

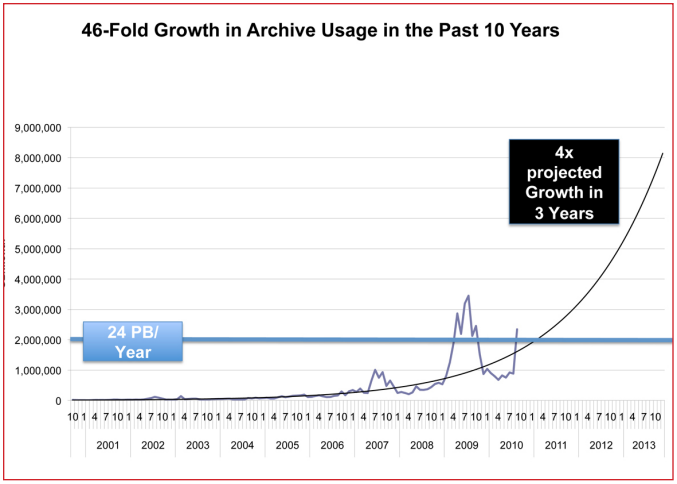
High-End Computing

The NASA Advanced Supercomputing (NAS) facility's Pleiades supercomputer has recently been expanded to a peak performance of over one petaflop. This additional computational capability has increased the demands on the archive infrastructure that stores the massive amounts of analysis data generated on the system.

To meet these growing demands, the NAS tape library has been reconfigured to increase the number and rate of tape load/unload cycles possible, improving the speed at which data can be recalled from archive. The tape technology has also been upgraded from the 4th generation of Linear Tape-Open format (LTO-4) to the newest, 5th generation tape (LTO-5). With LTO-5, the tape capacity nearly doubles from 800 gigabytes to 1.5 terabytes per cartridge, and the data transfer rate increases from 120 to 140 megabytes per second. These upgrades have enabled the capacity of the NAS tape library to increase significantly—from 22 petabytes to over 46 petabytes—without having to expand the number of tape slots.

In addition, NAS system engineers are currently evaluating software enhancements, such as enabling data to be transferred directly between the Lustre filesystem and the tape archive. This feature would further increase data transfer rates by bypassing the intermediate step of writing data to a disk cache on the archive server before it can be copied to tape or back to the filesystem.

Davin Chan, NASA Ames Research Center
davin.chan@nasa.gov



Graph showing the growth in the NASA Advanced Supercomputing facility's archive usage over the past 10 years, and projected future growth trend. *Davin Chan, NASA/Ames*